

What is claimed is:

1. A device for retaining an excess portion of a lead implanted within or on a surface of a brain of a patient, the device comprising:
 - a burr hole ring configured to be secured to a skull of the patient; and
 - a lead retainer extending from the burr hole ring, the lead retainer configured to store at least a section of the excess portion of the lead.
2. The device of claim 1 wherein the lead retainer is connected to the burr ring by an integral living hinge.
3. The device of claim 2 wherein the integral living hinge permits relative movement between the lead retainer and the burr hole ring between expanded and collapsed positions.
4. The device of claim 1 wherein the lead retainer is pivotally connected to the burr ring.
5. The device of claim 4 further comprising a pivot hinge to selectively enable the lead retainer to move between expanded and collapsed positions.
6. The device of claim 1 wherein the lead retainer is configured to releasably retain a plurality of different sections of the excess portion of the lead.
7. The device of claim 6 wherein the lead retainer is structured and arranged to releasably retain the excess portion of the lead in one of a plurality of different coiling configurations.
8. The device of claim 1 wherein the lead retainer is formed from a resilient material.

9. The device of claim 1 wherein the lead retainer comprises a plurality of grooves to releasably retain a plurality of different sections of the lead, each groove having a width that is less than an outside diameter of the lead, the width of each groove configured to accept the lead by increasing the width of the groove a distance at least as great as the outside diameter of the lead when a force is being applied to insert the lead into one of the grooves.
10. The device of claim 9 wherein each groove is configured to store multiple sections of the excess portion of the lead.
11. The device of claim 1 further comprising a plurality of lead retainers extending from the burr ring.
12. A device for retaining an excess portion of a lead that is implanted within or on a surface of a brain of a patient wherein access to the brain is provided through a burr hole in a skull of the patient, the device comprising:
 - a sleeve having an aperture extending therethrough, the sleeve being configured to be secured to a wall of the burr hole wherein the aperture is in general alignment with the burr hole; and
 - a flange extending from the sleeve, the flange having means for at least partially retaining at least a section of the excess portion of the lead.
13. The device of claim 12 wherein the retaining means includes at least a pair of tabs extending from an outside surface of the flange, the tabs configured to form a groove therebetween to retain at least a section of the excess portion of the lead.
14. The device of claim 12 wherein the retaining means includes a plurality of tabs extending from an outside surface of the flange, the tabs configured to form a groove between

adjacent tabs to thereby form a plurality of grooves to retain multiple sections of the excess portion of the lead.

15. A device for retaining an excess portion of a lead that is implanted within or on a surface of a brain of a patient wherein access to the brain is provided through a burr hole in a skull of the patient, the device comprising:
 - a burr hole ring having an aperture configured to receive the lead therethrough and an outside surface, the burr hole ring being configured to be secured to the skull wherein the aperture in the burr hole ring is in general alignment with the burr hole, the outside surface of the burr hole ring having means for retaining a section of the excess portion of the lead.
16. The device of claim 15 wherein the retaining means includes a groove system disposed in the outside surface of the burr hole ring dimensioned to accommodate the section of the excess portion of the lead.
17. The device of claim 16 wherein the groove system includes a spiral groove that extends from the aperture to at least one outlet at a periphery of the outside surface of the burr hole ring such that the excess portion of the lead can be stored in at least one loop in the groove system.
18. The device of claim 16 wherein the groove system includes a plurality of concentric, grooves extending circumferentially around the outside surface of the burr hole ring, and at least one generally radial groove in the outside surface communicating with the plurality of concentric grooves, the radial groove extending to an outlet at a periphery of the outside surface of the burr hole ring.
19. The device of claim 16 wherein the groove system is defined by a continuous spiral groove extending around the outside surface of the burr hole ring, and at least one

generally radial groove intersecting the spiral groove and leading to at least one outlet at a periphery of the outside surface of the burr hole ring wherein the spiral groove commences adjacent to the aperture in the burr hole ring.

20. The device of claim 15 wherein the burr hole ring is formed from a resilient material.
21. The device of claim 15 wherein at least a section of the excess portion of the lead is retained in the retaining means in one of a plurality of different coiling configurations.
22. A device for managing an excess portion of a lead implanted within or on a surface of a brain of a patient, the device configured to be used in conjunction with a burr hole ring having a flange and a sleeve extending from flange, the device comprising:
 - a ring having an aperture disposed therein for receiving the sleeve portion of the burr ring; and
 - at least one lead retainer extending from the disk to store at least a section of the excess portion of the lead.
23. The device of claim 22 further comprising a plurality of lead retainers disposed at spaced apart locations with respect to the ring.
24. The device of claim 22 wherein the lead retainer comprises a plurality of grooves to releasably retain a plurality of different sections of the lead.
25. A device for managing an excess portion of a lead implanted within a brain of a patient wherein access to the brain is provided through a burr hole in a skull of the patient, the device configured to be used in conjunction with a burr hole ring having an aperture for receiving a lead therethrough, the device comprising:
 - a disk having an aperture disposed therein, the aperture in the disk provided for general alignment with the burr hole and the burr hole ring aperture; and

at least one lead retainer extending radially outward from the disk to store at least a section of the excess portion of the lead.

26. A method of retaining an excess portion of a lead implanted within or on a surface of a brain of a patient wherein access to the brain is provided through a burr hole in a skull of the patient, the method comprising:
 - securing a burr hole ring to the skull of the patient, the burr hole ring having at least one lead retainer; and
 - inserting at least a section of the excess portion of the lead into the lead retainer to retain the lead.
27. The method of claim 26 further comprising the step of arranging the lead around the aperture in the burr hole device in one of a plurality of coiling configurations.
28. The method of claim 27 wherein the coiling configuration reduces a change in temperature at a contact of the lead when the patient is undergoing an MRI procedure.
29. A method of retaining an excess portion of a lead implanted within or on a surface of a brain of a patient wherein access to the brain is provided through a burr hole in a skull of the patient, the method comprising:
 - securing a burr hole ring to the skull of the patient, the burr hole ring having a plurality of lead retainers; and
 - inserting a plurality of different sections of the excess portion of the lead into the plurality of retainers to store the excess portion of the lead.
30. The method of claim 29 wherein the plurality of different sections of the excess portion of the lead are inserted into the plurality of retainers in a manner such that the excess portion of the lead is coiled around the burr hole.

31. The method of claim 30 wherein the excess portion of the lead is coiled around the burr hole in one loop.
32. The method of claim 30 wherein the excess portion of the lead is coiled around the burr hole in a plurality of loops.
33. A method of retaining an excess portion of a lead implanted within or on a surface of a brain of a patient wherein access to the brain to implant the lead is provided through a burr hole in a skull of the patient, the method comprising:
 - securing a retaining device to a skull of the patient, the retaining device having a one or more lead retainers; and
 - inserting one or more different sections of the excess portion of the lead into the one or more retainers to store the excess portion of the lead.
34. The method of claim 33 wherein the one or more different sections of the excess portion of the lead are inserted into the one or more lead retainers thereby forming a coiling configuration.
35. The method of claim 33 wherein the retaining device is secured to the skull at a spaced-apart location from the burr hole.
36. A method of retaining an excess portion of a lead implanted within or on a surface of a brain of a patient in a configuration that reduces a change in temperature at a contact of the lead when the patient is undergoing an MRI procedure, wherein access to the brain is provided through a burr hole in a skull of the patient, the method comprising:
 - securing a burr hole ring to the skull of the patient, the burr hole ring having a plurality of lead retainers; and
 - inserting a plurality of different sections of the excess portion of the lead into the plurality of lead retainers to retain the excess portion of the lead.

37. The method of claim 36 where the insertion step includes:
arranging the excess portion of the lead around the burr hole; and
placing sections of the excess portion of the lead into the plurality of retainers.
38. The method of claim 37 where the arrangement step includes forming the excess portion of the lead into a plurality of loops.
39. The method of claim 37 wherein the change in temperature decreases as the number of loops of the excess portion of the lead coiled around the burr hole increases.
40. The method of claim 36 wherein the lead is associated with a device selected from the group consisting of a neurostimulation lead, IPG, intracranial pressure monitor, CSF diversion device, fixed rate shunting device, programmable shunting device, and implantable microinfusion pump.
41. A method of retaining an excess portion of a lead implanted within or on a surface of a brain of a patient in a configuration that reduces a change in temperature at a contact of the lead when the patient is undergoing an MRI procedure, wherein access to the brain is provided through a burr hole in a skull of the patient, the method comprising:
inserting a retaining device within the patient at a spaced-apart location from the burr hole, the retaining device having a plurality of lead retainers; and
inserting a plurality of different sections of the excess portion of the lead into the plurality of lead retainers to retain the excess portion of the lead.
42. An apparatus comprising:
a substrate formed from biocompatible elastomer suitable for implantation into human or animal tissue;

a lead retainer supported by the substrate, the lead retainer configured to receive and releasably retain an excess portion of an implanted lead in a configuration selected to reduce heating of at least a portion of the implanted lead during an MRI procedure.

43. The apparatus of claim 42 wherein the substrate defines a central aperture sized to receive a burr hole device.
44. The apparatus of claim 42 wherein the substrate includes:
 - a flange having a diameter larger than a burr hole diameter; and
 - a sleeve extending from the flange having a diameter slightly less than the diameter of a burr hole provided in a skull of a patient.
45. The apparatus of claim 42 wherein the substrate defines a cavity sized to at least partially receive a medical treatment device configured for operative communication with the implanted lead.